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Michael Frank

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EXAMINER

CHEN, CHIA WEI A

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/823,161	Applicant(s) FRANK, MICHAEL	
	Examiner CHIA-WEI A. CHEN	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 4/16/2008 have been fully considered but they are not persuasive.

Applicant argues with respect to claim 1 that the heater does not provide direct heating to the image sensor chip.

However, reading the claims in the broadest sense, Ueno teaches that the heating element is sandwiched directly between the image sensor (1) and the package substrate (2) and is directly attached to the image sensor chip. Referring to Fig. 1, substrate (3) is an integral part of the image sensor (1) and insulation layer (4) is an integral part of heating element (5). Since the CCD substrate (3) is an integral part of the CCD and cannot be separated, and since the insulation layer (4) is an integral part of heating element (5) and cannot be separated, the CCD and its required components are directly attached to the heating element and its required components.

Applicant argues with respect to claim 1 that the gelatinous material 3 described by Anton is not an adhesive material.

However, reading the claims in the broadest sense, Anton teaches an epoxy material (3) is used to attach the integrated optical device (1) to a ceramic substrate (2) in Figure 4 as well as in paragraph 17. Figure 4 shows that the epoxy material fills the

same space as an adhesive (5), and the two components are used together to attach the integrated optical device to the substrate. Thus the rejection of claim 1 is sustained.

Applicant argues that Barlow does not teach or suggest that protection resistors can be applied to a heater element.

However, it is well known in the art to use protection resistors to protect against electro static discharge. Barlow teaches the usage of protection resistors to protect electronic components and the combination of Ueno in view of Barlow teaches that protection resistors can be applied to an electronic heating element. Therefore the rejection of claims 11-13 are sustained.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 1, 6, 8, 9, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. (US 5,334,829) in view of Anton (US 2003/0089957 A1).

As to Claim 1, Ueno et al. teaches, in figure 1, an integrated circuit package for an image sensor chip, the image sensor chip including a sensor area for sensing incident light and a circuitry area (col. 3, lines 64-67), the package comprising:

- a substrate (package 2) including a first surface for receiving an image sensor chip and a second surface having an array of contact terminals formed thereon (col. 4, lines 8-15, 36-42); and
- a heater element (5) having a first terminal and a second terminal coupled to a first contact terminal and a second contact terminal, respectively, of the array of contact terminals, the heater element being positioned on the first surface of the substrate and directly underneath the sensor area of the image sensor chip to be assembled in the package, the image sensor chip to be placed directly on the heater element (col. 4, lines 16-26, 36-42),
- wherein the heater element provides heating of the sensor area of the image sensor chip when a first voltage is applied across the first contact terminal and the second contact terminal (col. 4, lines 50-61); and
- wherein the image sensor chip is attached directly to the heater element and the first surface of the substrate so that the heater element is sandwiched directly between the sensor area of the image sensor chips and the first surface of the substrate to provide direct and localized heating of the sensor area of the image sensor chip (package 2) (Figs. 1, 4).

But does not teach wherein the image sensor chip is attached to the heater element and the first surface of the substrate using an epoxy glue.

Anton teaches wherein the image sensor chip is attached to the heater element and the first surface of the substrate using an epoxy glue (gelatinous material RBC Epoxy, paragraph [0017]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the epoxy glue of Anton with the integrated circuit package of Ueno et al. in order to maintain the temperature of the chip in a stable manner. (See paragraph [0003] of Anton.)

As to claim 6, Ueno et al. teaches wherein the package comprises a pin grid array package and the array of contact terminals comprises an array of contact pins (pins 9a, 9b, 9c, Fig. 1,).

As to claim 8, Ueno et al. teaches wherein the heater element comprises a resistive heater element (7, col. 4, line 30).

As to claim 9, Ueno et al. teaches wherein the resistive heater element comprises a material selected from conductive plastic and conductive metals (col. 6, lines 8-16).

As to claim 14, Ueno et al. teaches wherein the first terminal of the heater element is connected to the first contact terminal through a first via interconnect (9a) through the substrate of the package and the second terminal of the heater element is connected to the second contact terminal through a second via interconnect (9b) through the substrate of the package (Fig. 3).

As to claim 15, Ueno et al. teaches a heat spreader formed in the substrate (The heating device is formed on a lower surface of the insulating material to uniformly heat the solid state imaging device, thus acting as a heat spreader; col. 5, lines 60-68.).

4. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. (US 5,334,829) in view of Anton (US 2003/0089957).

Ueno et al. in view of Anton discloses substantially the claimed invention as set forth in the discussion for claims 4 and 5.

Ueno et al. does not disclose expressly wherein the array of contact terminals comprises an array of contact balls or contact pads.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to configure the array of contact terminals to be contact balls or pads. Applicant has not disclosed that configuring the array of contact terminals to be contact balls or pads provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, further more, would have expected Applicant's invention to perform equally well with either the contact pins taught by Ueno et al. or the claimed contact balls or pins because both contact terminal designs perform the same function of allowing an electrical path to the components of the integrated circuit package. Therefore, it would have been obvious to modify Ueno et al. in view of Anton to obtain the invention as specified in claims 4 and 5.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. in view of Anton as applied to claim 1 above, and further in view of Ozimek et al. (US 5,865,935).

As to claim 7, Ueno et al. in view of Anton teaches the integrated circuit package of claim 1, but does not teach wherein the package comprises a ceramic or plastic leaded chip carrier and the array of contact terminals comprises an array of contact pins formed on the side surfaces of the package.

Ozimek et al. teaches wherein the package comprises a ceramic (12) or plastic leaded chip carrier and the array of contact terminals comprises an array of contact pins (22) formed on the side surfaces of the package (Fig. 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the ceramic chip carrier of Ozimek et al. with the integrated circuit package of Ueno et al. as modified by Anton to provide an improved method for securing image sensors to a ceramic member and to provide the smallest possible diameter available to adequately house the image sensor and to provide greater integrity of the package. (See col. 2, lines 18-25 of Ozimek et al.)

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. in view Anton as applied to claim 8 above, and further in view of Ito et al. (US 2003/0164365 A1).

As to claim 10, Ueno et al. in view of Anton teaches the integrated circuit package of claim 8, wherein the resistive heater element is formed in a narrow serpentine shape (Fig. 2 of Ueno et al.). Ueno et al. in view of Anton does not teach wherein the resistive heater element is formed of tungsten.

Ito et al. teaches wherein the resistive heater element is formed of tungsten (paragraph [0105] of Ito et al.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the tungsten heating element of Ito et al. with the integrated circuit package of Ueno et al. as modified by Anton so that thermal diffusion of the impurities from the ceramic heater to the semiconductor wafer can be prevented. (See paragraph [0014] of Ito et al.)

7. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. in view of Anton as applied to claim 1 above, and further in view of Barlow et al. (US 4,420,261).

As to claim 11, Ueno et al. in view of Anton teaches the integrated circuit package of claim 1, but does not teach a protection resistor coupled between the first terminal and the second terminal of the heater element.

Barlow et al. teaches a protection resistor coupled between the first terminal and the second terminal of the heater element (resistors 102 and 103, col. 11, lines 37-40).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the protection resistor of Barlow et al. with the integrated circuit package of Ueno et al. as modified by Anton to protect the output against static electric discharges or other accidental stress. (See col. 11, lines 38-40).

As to claim 12, Barlow et al. teaches wherein the protection resistor comprises a high resistance resistor (col. 11, lines 37-40).

As to claim 13, Barlow et al. teaches wherein the resistance of the protection resistor is about 100 Ohms or greater (col. 11, lines 37).

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHIA-WEI A. CHEN whose telephone number is (571)270-1707. The examiner can normally be reached on Monday - Friday, 7:30 - 17:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chia-Wei A Chen/
Examiner, Art Unit 2622
07/09/2008

***/Ngoc-Yen T. VU/
Supervisory Patent Examiner, Art Unit 2622***